21 November 2018

ECONOMICS AND INDUSTRY STANDING COMMITTEE - INQUIRY INTO MICROGRIDS AND ASSOCIATED TECHNOLOGIES IN WA

Australian Energy Market Operator opening statement:

Thank you for the opportunity to appear again before the Committee. The Committee's terms of reference are timely and very much aligned with a number of critical areas of focus for the Australian Energy Market Operator.

Recognising that Distribution Energy Resources (DER) are a key driver of change in our energy landscape, and that taking no action could result in significant system and market challenges, DER is one of six strategic focus areas for AEMO in the next two years.

With DER, the energy system is moving from a system that is dominated by central large-scale, synchronous power plants with passive consumption, to one that includes a multitude of resources and technologies of various sizes. At the same time, consumers are engaging with their electricity services in new ways, and with this we are seeing a significant proportion of energy being generated at the consumer premises – facilitating a move from a centralised to a decentralised system.

Western Australia is not alone. Integrating DER is a key focus globally. Along with the rest of the country, Western Australia has substantial volumes of DER and may be the first to have to make some key decisions - passively or proactively in the management of the resources. Given this, there is continued momentum for a proactive coordinated program to integrate DER. AEMO plays a key role in this, which builds on our globally unique position as an independent system, wholesale and retail market operator across multiple networks and covering both gas and electricity.

As an independent operator that includes our facilitation role in wholesale and retail markets, AEMO is in a position to reduce barriers to trade in the provision of DER optimisation, facilitate peer-to-peer trading, enable network support services between networks and DER providers, and data services for third parties. The opportunities for consumers are significant, and AEMO wants to partner with market, industry, government, consumer groups and regulatory bodies to achieve these opportunities.

However, there are a number of challenges - including the current regulatory regime in Western Australia, which is a focus for this Committee.

The regulatory regime will generally be behind the market and is presently insufficiently flexible to easily accommodate the adoption of new and emerging technologies. The Wholesale Electricity Market and network system in Western Australia is limiting positive aspects of DER due to its ageing market design, which is enshrined in the current regulatory regime.

The decentralised and fragmented regulatory framework in Western Australia increases the work required to keep up with changes in technology and market dynamics. For example, beneath the *Electricity Industry Act 2004*, regulation is divided amongst WEM Rules, the Electricity Networks Access Code, the Technical Rules, the Network Quality and Reliability of Supply Code and the Metering Code - with various different change processes and authorities.

AEMO acknowledges that keeping regulatory frameworks current - especially in relation to how quickly the energy market is evolving - is challenging, but the fragmentation in Western Australia compounds this further. Therefore, it is AEMO's view that the current Wholesale Electricity Market reform program in WA must continue as a high priority which will make a number of regulatory improvements.

Importantly for DER, the reform program will consider regulatory changes that allow the connection, registration and participation of new technologies that are currently not contemplated in the regulatory framework. This includes technologies such as Microgrids, storage facilities, hybrid facilities and Virtual Power Plants.

The reforms will also increase automation in market and system operation, promote greater flexibility for consumers and generators, support increased asset utilisation for networks and generation as well as improve market efficiency.

The reforms will implement least-cost security-constrained economic dispatch, which is common practice in most liberalised electricity markets. As the name suggests, this optimisation process will dispatch suppliers and customers based on least cost, without regard for network access rights.

The enhanced automation of market and system operation is critical for an increasingly variable power system. AEMO is already facing growing challenges in running the power system, including an increasing need to intervene in the market to ensure system security and reliability and the prospect of implementing costly interim system changes to assist in managing power system security - with the costs ultimately borne by consumers.

The implementation of this least-cost dispatch optimisation requires the transition to a constrained network access regime, for which AEMO understands legislation is scheduled to be tabled in Parliament in early 2019. It is vital that constrained network access arrangements are enacted to provide early certainty to the Public Utilities Office's work on network and WEM reforms.

The increasing proportion of variable renewable generation and DER are reducing AEMO's available control levers to manage the reliability and security of the power system. Where mitigation strategies are not undertaken, the growth in PV generation in particular may see insufficient synchronous plant being dispatched to keep the system secure for contingency events by the early 2020's.

Greater coordination of DER is required through a number of approaches, including:

- Allowing price signals to flow to DER owners to incentivise behaviour that benefits the system as a whole, whilst also improving consumers' return on their DER investments;
- Enabling customers to engage with multiple service providers to offer services to the market;
- Aggregation that could be localised in Microgrids, which could participate in a central market and then can dispatch;
- Aggregation of dispersed DER can also be enabled, including through virtual power plants; this requires more active management of the distribution network, which is being explored in the Open Energy Networks collaboration with industry being led by AEMO and Energy Networks Australia;
- Undertaking long-term system planning, to deliver a strategic infrastructure development plan, based on sound engineering and economics, that would incorporate the needs and opportunities offered by DER along with proposed infrastructure and energy developments.

Where price signals are absent or otherwise insufficient to elicit desired behaviour, AEMO would need to be empowered with controls to modify DER output where system security is at risk.

AEMO's DER strategy is focused on delivering value to all consumers by harnessing the opportunities provided by DER. These opportunities include:

- Providing choice to consumers by maximising opportunities for all connected parties to engage with the electricity market;
- Ensuring efficient investment by maximising the utilisation of DER to avoid inefficient investment in supply and network capacity; and
- Promoting transparent, efficient operation of the power system by incorporating DER into market pricing and dispatch processes, using incentives and optimisation techniques.

As outlined in AEMO's previous submission to the Committee, the objective of any Microgrid and DER-related reform should be to facilitate a broad range of opportunities in regard to new business models and technologies, market development, and new approaches to power system and market operation and planning.

The potential benefits are significant; however, these will be far outweighed by the consequences of not managing the adverse impacts of this new technology so as to ensure the security and reliability of the power system, and market effectiveness resulting in negative outcomes for consumers.

Provided that the right changes are made to technical, regulatory and market frameworks, Microgrids can be used to effectively integrate active consumers into the power system as it evolves to a low-carbon electricity network.

Thank you.

Audrey Zibelman
Chief Executive Officer
Australian Energy Market Operator